

## HR-285 Automatic Tracer-Dilution Method Used For Stage-Discharge Ratings And Streamflow Hydrographs On Small Iowa Streams

**Key Words:** Streamflow monitoring, Tracer-dilution method, Hydrographs

### ABSTRACT

An automatic system was designed to concurrently measure stage and discharge for the purpose of developing stage-discharge ratings and high flow hydrographs on small streams. Stage, or gage height, is recorded by an analog-to-digital recorder and discharge is determined by the constant-rate tracer-dilution method. The system measures flow above a base stage set by the user. To test the effectiveness of the system and its components, eight systems, with a variety of equipment, were installed at crest-stage gaging stations across Iowa. A fluorescent dye, rhodamine WT, was used as the tracer.

Tracer-dilution discharge measurements were made during 14 flow periods at six stations from 1986 through 1988 water years. Ratings were developed at three stations with the aid of these measurements. A loop rating was identified at one station during rapidly changing flow conditions. Incomplete mixing and dye loss to sediment apparently were problems at some stations. Stage hydrographs were recorded for 38 flows at seven stations. Limited data on background fluorescence during high flows were also obtained.